

REMARKS

Claims 1-16, 20, 22-53 and 57-79 were pending and stand rejected. Claims 1-4, 26-28, 53, 57-61 are amended. Claims 1-16, 20, 22-53 and 57-79 are pending.

Interview Summary

On November 10, 2009, the Examiner, Robert R. Sachs, and Sassah Pehjan had an in-person interview during which they discussed the independent claims with respect to cited references. An agreement was reached in which the Examiner agreed that the independent claims are allowable based upon the amendments as suggested by the Examiner. The arguments set forth during the interview are summarized below.

Response to Rejection under 35 USC §103(a)

1-18, 20-56 and 58 under 35 USC §103(a) as being unpatentable over Biswas et al. (U.S. Patent No. 7,197,074) (“Biswas”) in view of Burl (U.S. Patent No. 5,940,145) (“Burl”) in further view of Pau et al. (U.S. Publication No. 2002/0012396) (“Pau”). This rejection is respectfully traversed.

As suggested by the Examiner, claim 1 is amended to recite identifying a number of highest phase correlation peaks within an inner area of a phase correlation surface. As amended, claim 1 now recites (emphasis added):

establishing a size for phase correlation blocks, the size for the phase correlation blocks being larger than the maximum allowable magnitude of the motion vector;

identifying a number of highest phase correlation peaks within an inner area of a phase correlation surface based upon a phase correlation block of the predicted video frame and a corresponding phase correlation block of the reference video frame, the inner area having a size equal to or less than the maximum allowable magnitude of a motion vector;

determining for each phase correlation peak identified in the inner area, a motion vector; and
selecting from the determined motion vectors, a motion vector that has the minimum distortion measure between the block and a reference block offset from the block by the motion vector among the determined motion vectors.

Independent claims 26-28, 53, 57-61 are amended to recite similar language as claim 1.

The Examiner agreed during the interview that Biswas and Burl, both individually and in combination, do not disclose or teach identifying a number of highest phase correlation peaks within an inner area of a phase correlation surface, as claimed. The Examiner previously acknowledged that that Biswas or Burl does not teach selecting from the determined motion vectors, a motion vector that has a minimum distortion, and depends on Pau to allegedly disclose the claimed feature. However, Pau does not remedy the deficiencies of Biswas and Burl. Pau discloses a method of motion estimation of video signals (Abstract). However, Pau does not disclose identifying a number of highest phase correlation peaks within an inner area of a phase correlation surface, as claimed.

Based on the above remarks, Applicants respectfully submit that for at least these reasons independent claims 1, 27-28, 53 and 57-58 are patentably distinguishable over Biswas, Burl and Pau, both individually and in combination. Therefore, Applicants respectfully request that Examiner reconsider the rejection, and withdraw it.

The dependent claims are also patentable over the cited references, both because each depends from patentable independent claims, respectively, and because each also recites its own patentable features. Therefore, Applicants respectfully submit that claims 1-16, 20, 22-55 and 57-58 are patentably distinguishable over the cited references.

Claim 6 and 33 were rejected under 35 USC §103(a) as being unpatentable over

Biswas in view of Burl in further view of Pau and in further view of Zhang et al. (U.S. Patent No. 6,449,312) (“Zhang”). This rejection is respectfully traversed. Claims 6 and 33 depend from their respective base claims, which are patentable over Biswas, Burl and Pau both individually and in combination. Zhang does not remedy the deficiencies of Biswas, Burl and Pau. Zhang’s method of motion estimation is fundamentally different from the method disclosed by both the claimed invention and Biswas. Zhang searches for the best motion vector candidate by starting at a certain point, and then moving along a search path according to various criteria in pixel domain. However, Zhang does not disclose identifying a number of highest phase correlation peaks within an inner area of a phase correlation surface, as claimed. Thus, claims 6 and 33 are patentable over Biswas, Burl, Pau and Zhang, both individually and in combination.

Claims 10-11 and 37-38 were rejected under 35 USC §103(a) as being unpatentable over Biswas in view of Burl in further view of Pau and in further view of Aude (A Tutorial in Coherent and Windowed Sampling with A/D Converters, Feb. 1997) (“Aude”). This rejection is respectfully traversed. Claims 10-11 and 37-38 depend from their respective base claims, which are patentable over Biswas, Burl and Pau both individually and in combination. Examiner depends on Aude’s coherent and windowed sampling with A/D converters to reject claims 10-11 and 37-38. But Aude does not remedy the deficiencies of Biswas, Burl and Pau as set forth above. Thus, claims 10-11 and 37-38 are patentable over Biswas, Burl, Pau and Aude, both individually and in combination.

Claims 20, 21, 46, 47, 48, 57 and 58 were rejected under 35 USC §103(a) as being unpatentable over Biswas in view of Burl in further view of Pau and in further view of Biswas et al. (A Novel Motion Estimation Algorithm Using Phase Plane Correlation for Frame Rate

Conversion, November 2002) (“Biswas 2”). This rejection is respectfully traversed. Claims 20, 47-48 and 57-58 depend from their respective base claims, which are patentable over Biswas, Burl and Pau both individually and in combination. Biswas2 does not remedy Biswas, Burl and Pau. Biswas2 teaches using phase plane correlation for frame rate conversion. Biswas2 uses a threshold value to evaluate the similarity between the current block of interest and its 8 neighbors (Section 3). However, this threshold is unrelated to the number of the phase correlation peaks based on a maximum allowable motion vector magnitude. Further, because Biswas2 is merely a further elaboration of Biswas (that is, Biswas2 appears to include everything in Biswas, plus additional content), the combination of these references provides nothing more than what Biswas2 alone discloses. As such, Biswas2 does not disclose the claimed features. Therefore, claims 20, 47-48 and 57-58 are patentable over Biswas2 and other cited references, both individually and in combination.

In sum, all of the claims are patentable over all cited references, both individually and in combination.

Applicants note that narrowing amendments made in response to a previous Office Action has been reversed in this amendment. In view of the Federal Circuit’s decision in *Hakim v. Cannon Avent Group PLC*, 81 U.S.P.Q.2d (BNA) 1900 (Fed. Cir. 2007), Applicants hereby rescind any disclaimer that may have resulted from the previous amendments or arguments associated therewith.

Conclusion

Applicants respectfully submit that the pending claims are allowable over the cited art of record for at least the above reasons and request that the Examiner allow this case. The Examiner is invited to contact the undersigned in order to advance the prosecution of this application.

Respectfully submitted,
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